GefenPRO®

1080P PROGRESSIVE

HDMI® HIGH-DEFINITION MULTIMEDIA INTERFACE

8x8 Matrix for HDMI w/4 ELR-POL Outputs

GEF-HDFST-848-4ELR
User Manual

www.gefenpro.com

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INTRODUCTION

Congratulations on your purchase of the GefenPRO *8x8 Matrix for HDMI w/4 ELR Outputs.* Your complete satisfaction is very important to us.

About Gefen

We specialize in total integration for your home theater, while also focusing on going above and beyond customer expectations to ensure you get the most from your hardware. We invite you to explore our distinct product line. Please visit http://www.gefen.com for the latest offerings in High-Definition signal solutions or call us between the hours of 8:00 am and 5:00 pm Monday-Friday, Pacific Standard Time for assistance with your A/V needs. We'll be happy to assist you.

The GefenPRO 8x8 Matrix for HDMI w/4 ELR-POL Outputs

The GefenPRO 8x8 Matrix with four ELR and four HDMI outputs routes up to eight Hi-Def sources at resolutions up to 1080p Full HD with Deep Color and multi-channel digital audio to any of eight HDTV displays, eliminating the need to disconnect and reconnect HDMI sources and displays. It features extension of four displays up to 330 feet (100 meters), using Gefen's ELR (Extra Long Range) and POL (Power Over Link) technologies. ELR extension on four outputs allows installation of displays over a single CAT-5e cable. POL eliminates the need to externally power the four included ELR receivers. The GefenPRO 8x8 Matrix supports 3DTV and advanced digital audio formats such as Dolby® TrueHD and DTS-HD Master Audio™. Each source is accessible at all times from any display by using the included IR Remote Control, the RS-232 port, IP (Telnet or Web GUI), or by using the front-panel push buttons.

Fast Switching Technology (FST) is a Gefen software implementation for HDMI products. FST was created to improve the lengthy HDMI authentication process, based on the HDMI and HDCP specifications. FST allows connecting/disconnecting or turning any of the HDTV displays on or off without affecting other displays within the audio/video distribution system.

How It Works

Using HDMI cables, connect up to eight Hi-Def sources to the HDMI inputs on the matrix. Connect up to four HDTV displays to the HDMI outputs on the matrix and up to four HDTV displays to the supplied ELR-POL receivers. Use a single CAT-5e cable to connect each of the receivers to the matrix. An external power supply is not required because power is delivered by the matrix over the CAT-5e cables. 3D content can be displayed when connecting a 3DTV and 3D source. Connect the included AC power cord to the matrix and plug it into an available electrical outlet. Turn on the matrix by pressing the power switch. Apply power to sources and to the displays. The Hi-Def sources can now be routed to any display by using the IR remote control, RS-232 port, IP (Telnet or Web GUI), or by using the front-panel push buttons.

READ THESE NOTES BEFORE INSTALLING OR OPERATING THE 8X8 MATRIX FOR HDMI W/4 ELR-POL OUTPUTS

- EDID contains the A/V capabilities of a display device in regards to video resolutions and audio formats supported. This information is used by the source device to determine the format of the A/V signal on the outputs. The 8x8 Matri*x for HDMI w/4 ELR-POL Outputs* incorporates advanced EDID management to ensure compatibility with all sources and display devices. See pages 36 for more details.

- The GefenPRO *8x8 Matrix for HDMI w/4 ELR-POL Outputs* can detect the presence of Deep Color (12-bit signal) automatically and will disable Deep Color EDID features across all other outputs if any connected device or display is not capable of processing Deep Color. This automatic behavior ensures compatibility among all output devices in a mixed-device environment. This feature cannot be disabled.

FEATURES

Supported HDMI Features

- Resolutions up to 1080p Full HD
- HDCP compliant
- 12-bit Deep Color
- x.v. Color
- LPCM 7.1 audio, Dolby Digital® Plus, Dolby® TrueHD, and DTS-HD® Master Audio™
- 3DTV pass-through
- Lip-Sync pass-through

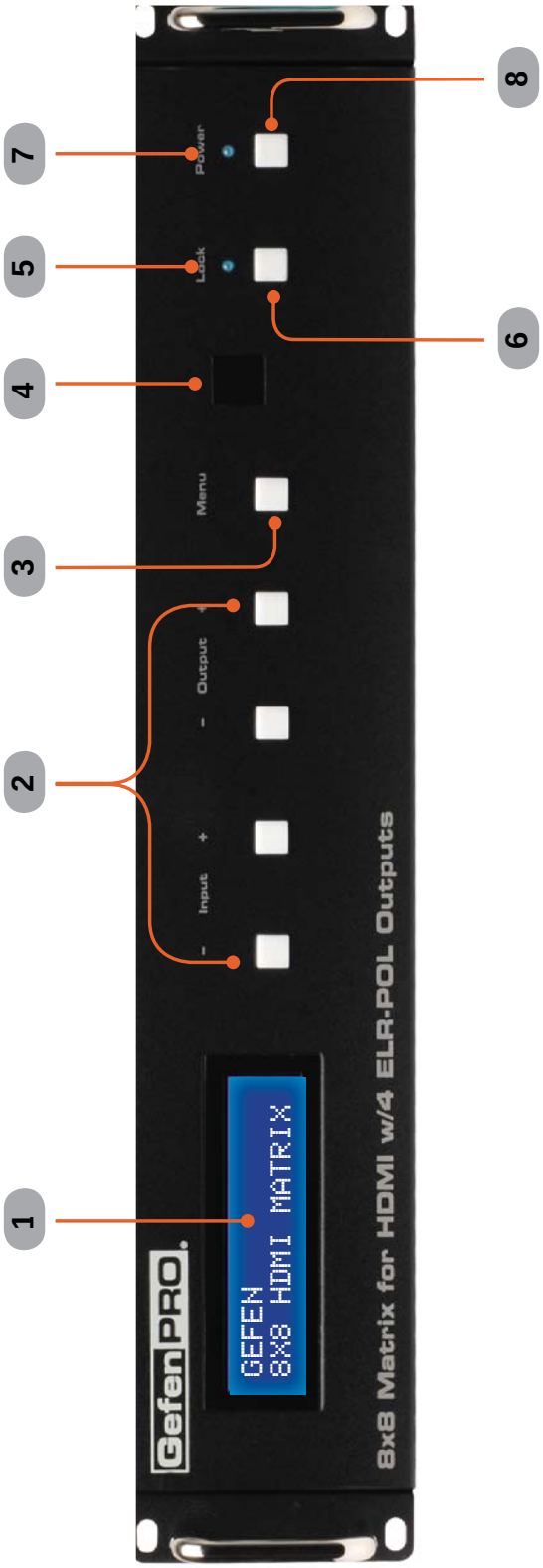
Features

- Routes any eight Hi-Def sources to any eight HD displays, independently
- ELR technology allows extension up to 330 feet (100 meters)
- POL feature provides power to each ELR receiver
- HDBaseT® technology
- Gefen FST speeds up the HDCP authentication process
- Fast and Slow FST Modes
- Advanced EDID Management for rapid integration of sources and displays
- Ability to save and recall presets
- Supports DVI sources and displays
- Field-upgradeable firmware via IP or RS-232
- Front Panel Switching
- IR Control of the matrix via front panel sensor and from each Receiver (using EXT-RMT-EXTIRC)
- Serial (RS-232) and IP Control via Web Server and Telnet
- Rack mountable (2U tall, rack ears included)
- Internal power supply with detachable IEC AC cord
- Back panel master power switch

Package Includes

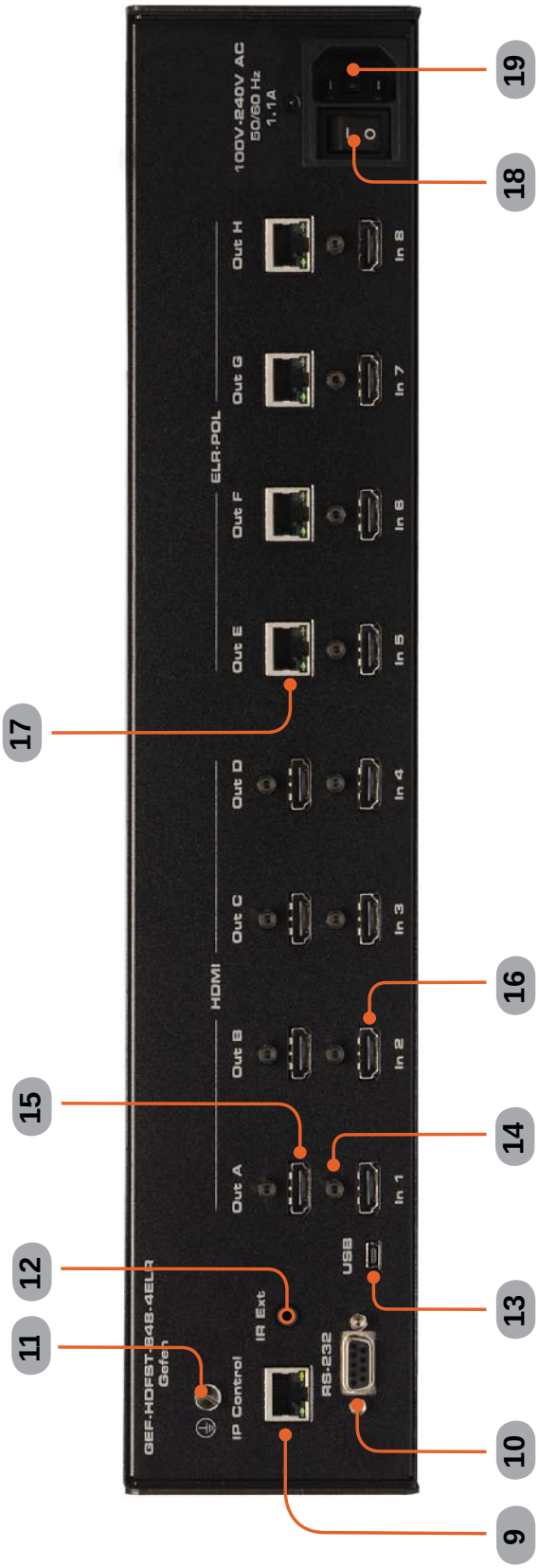
(1) 8x8 Matrix for HDMI w/4 ELR-POL Ouputs
(1) Set of Rack Ears (Attached)
(8) Extender for HDMI ELR-POL (Receiver Units)
(1) IR Remote Control
(1) AC Power Cord
(1) Quick-Start Guide

Front


1
2
3
4
5
6
7
8
Power
Lock
Menu
Output
Input
GefenPRO
GEFEN
8X8 HDMI MATRIX
8x8 Matrix for HDMI w/4 ELR-POL Outputs

MATRIX LAYOUT

Back



Front

1 LCD Display
This is a two-line, sixteen-character display that shows status information and is also used to manage display / source routing.

2 Navigation Buttons (Input / Output)
Used for routing and adjusting settings of the *8x8 Matrix for HDMI w/4 ELR-POL Outputs*. See the information beginning on page 15 for details on using these buttons.

3 Menu
Press this button to display routing, switching mode, and IP address information.

4 IR Sensor
Receives signals from the IR Remote Control.

5 Lock Indicator
This LED glows bright blue when the front panel is locked.

6 Lock Button
Pressing this button temporarily locks the front panel controls.

7 Power Indicator
This LED indicator will glow bright blue when the matrix is powered on. When the matrix is in standby mode, this LED indicator will glow bright red. The power switch, on the back of the matrix, must be switched to the the ON position in order for this LED indicator to function.

8 Power Button
Press this button to power-on and power-off the matrix.

Back

9 IP Control

Connect an Ethernet cable to this port to control the *8x8 Matrix for HDMI w/4 ELR-POL Outputs* using IP Control. See page 38 for more information on configuring the matrix for IP control.

10 RS-232

Connect an RS-232 cable from this DB-9 connector to the RS-232 control device. See page 28 for more information.

11 Grounding Screw

Used to keep electrical current away from circuitry

12 IR EXT

Connect an IR extender (Gefen part no. EXT-RMT-EXTIRC) to this jack

13 USB

Service port for manufacturer use only.

14 HDMI Locking Connector

Used to lock the HDMI cable in place.

15 HDMI Outputs (A - D)

Connect up to four HDTV displays to each of these ports using HDMI cables.

16 HDMI Inputs (1 - 8)

Connect a Hi-Def source to each of these ports using HDMI cables.

17 ELR-POL Outputs (E - H)

Connect a CAT-5e (or better) cable from each of these jacks to the ELR-POL In jacks on the ELR-POL Receiver units.

18 Power Switch

Turn the power ON or OFF using this switch.

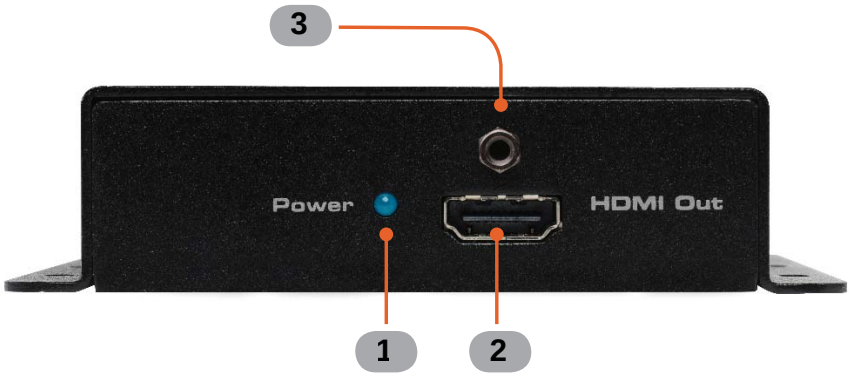
19 110/220 AC Power Receptacle

Connect the included AC power cord to this receptacle and connect the plug to an available electrical outlet.

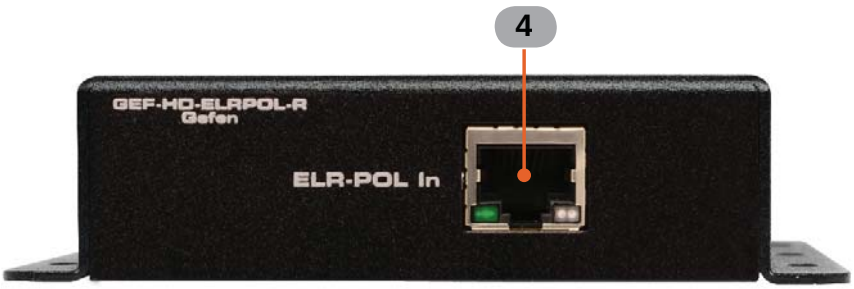
ELR-POL RECEIVER LAYOUT

Top

Front



Back



ELR-POL RECEIVER DESCRIPTIONS

Top / Front / Back

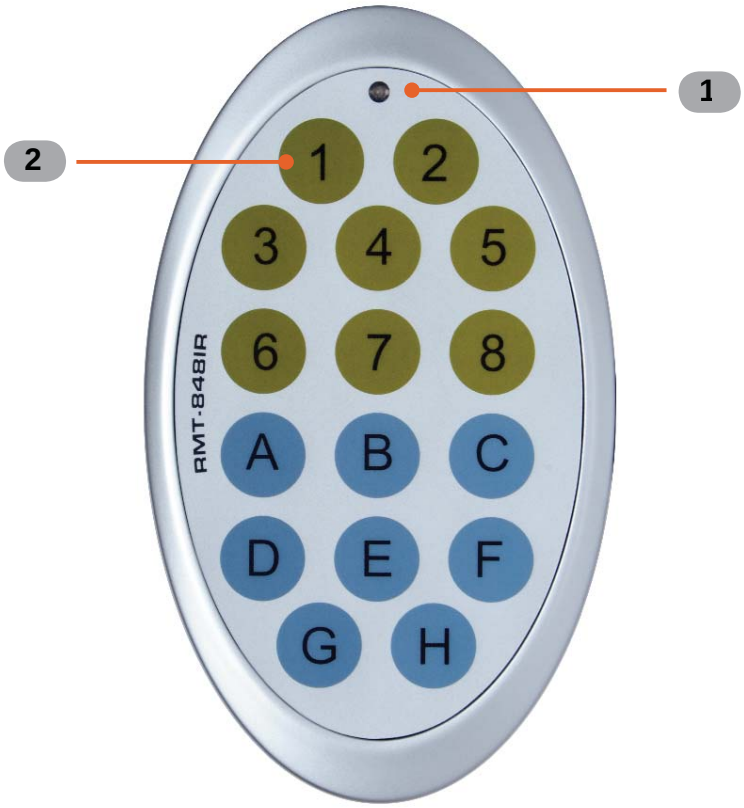
1 Power Indicator
This LED indicator will glow bright blue when the matrix is powered and the ELR-POL Receiver unit is connected to the matrix using CAT-5e (or better) cable.

2 HDMI Out
Connect an HDTV display to the HDMI Out port using an HDMI cable.

3 HDMI Locking Connector
Used to lock the HDMI cable in place.

4 ELR-POL In
Connect a CAT-5e (or better) cable from this jack to one of the ELR-POL jacks on the *8x8 Matrix for HDMI w/4 ELR-POL Outputs*.

Layout and Description (RMT-848IR)



1 ***LED Button Press Indicator***
This LED will be activated momentarily each time a button is pressed.

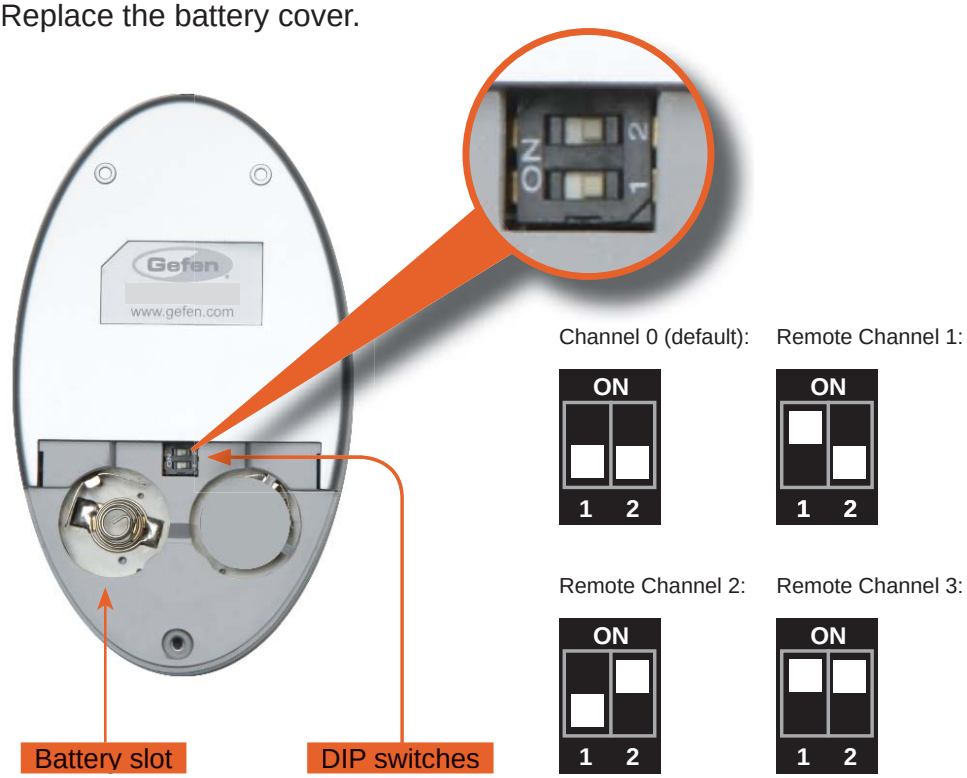
2 ***Display and Source Selection Buttons***
These buttons are used to select which source is routed to a display. The Source and Display buttons are mapped as follows:

NOTE: An Activity Indicator that flashes quickly while holding down any one of the 16 buttons indicates a low battery. Replace the IR Remote Control battery as soon as possible.

Installing the Battery

The Remote Control unit ships with two batteries (CR2032 lithium battery). One battery is required for operation and the other battery is a spare.

1. Remove the battery cover on the back of the IR Remote Control unit.
2. Insert the included battery into the open battery slot. The positive (+) side of the battery should be facing up.
3. Replace the battery cover.



Setting the IR Channel

The IR channel on the IR Remote Control must match the IR channel used by the *8x8 Matrix for HDMI*. For example, if both DIP switches on the IR Remote Control unit are set to IR channel 0 (both DIP switches down), then the *8x8 Matrix for HDMI* must also be set to IR channel 0. See pages 23 and 72 for information on how to change the IR channel on the *8x8 Matrix for HDMI*.

WARNING: Risk of explosion if battery is replaced by an incorrect type**.** Use only 3V lithium batteries CR-2032.

How to Connect the 8x8 Matrix for HDMI w/4 ELR-POL Outputs

1. Connect up to eight Hi-Def sources to the *8x8 Matrix for HDMI w/4 ELR-POL Outputs* using HDMI cables.

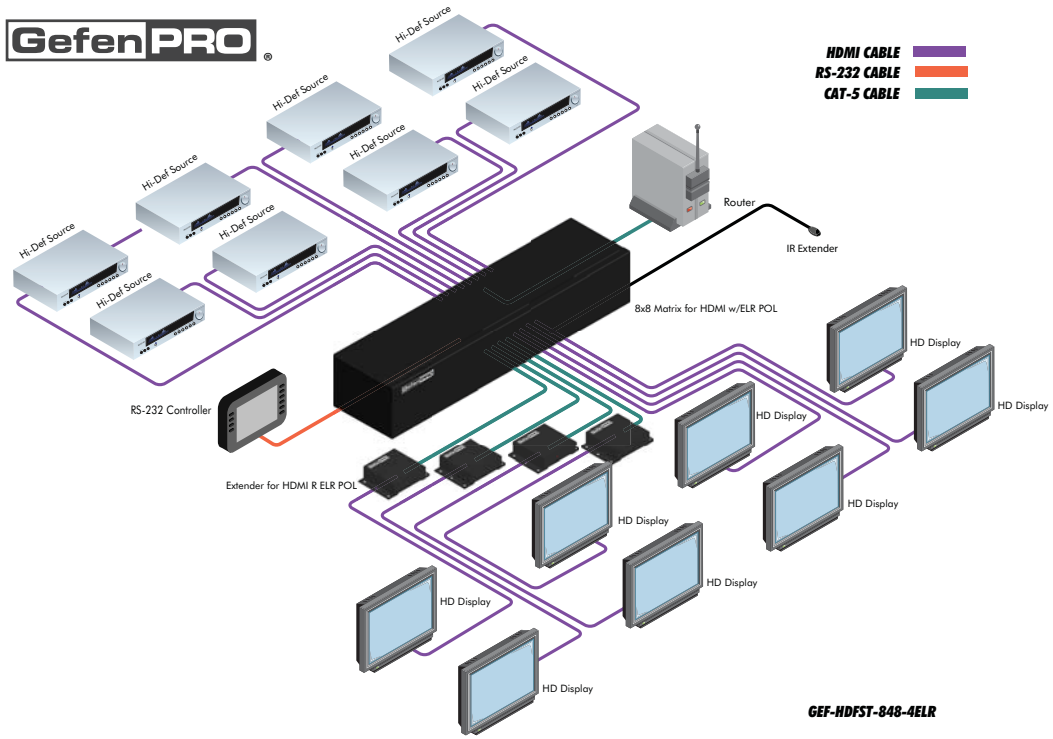
2. Using HDMI cables, connect up to four HDTV displays to the HDMI outputs on the matrix, and up to four HDTV displays to the supplied ELR-POL Receiver units.

3. Connect each ELR-POL Receiver unit to the *8x8 Matrix for HDMI w/4 ELR-POL Outputs* using CAT-5e (or better) cables.

> **NOTE:** When connected to the matrix, each ELR-POL Receiver unit is powered over the CAT-5e cable. No external power supplies are required for the ELR-POL Receiver units.

4. Connect the AC power cord to the matrix and connect the plug to an available electrical outlet.

Wiring Diagram for the 8x8 Matrix for HDMI w/4 ELR-POL Outputs



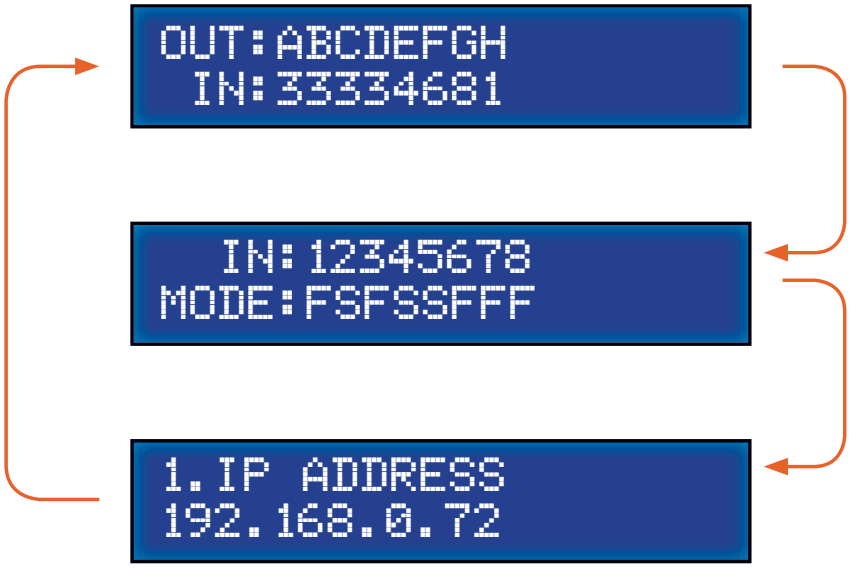
Main Display

The **Main Display** of the *8x8 Matrix for HDMI w/4 ELR-POL Outputs* is a 16 character 2 line display. This display shows the current routing status of the matrix and is also used to display additional system information. When the unit is powered on, the following screen is displayed:

After a few moments, the status screen is displayed. The status screen is shown below:

Displaying Additional Information

Consecutively pressing the **Menu** button, on the front panel, will cycle through other screens such as FST mode and IP information:



Determining the Current Routing State

In the example below, the first row (OUT) represents each HDMI output on the matrix. The bottom row (IN) represents each HDMI input on the matrix. Together, these two rows display the current routing state.

Starting on the bottom row, we can see that Input 3 has been routed to Outputs A, B, C, and D. Continuing on, Input 4 is routed to Output E, Input 6 is routed to Output F, Input 8 is routed to Output G, and finally Input 1 is routed to Output H.

Note that each output (A - H) specified in the LCD display, corresponds to each of the HDMI inputs (1 - 8) on the matrix.

If all inputs are routed to their respective outputs, the front-panel display will appear as follows:

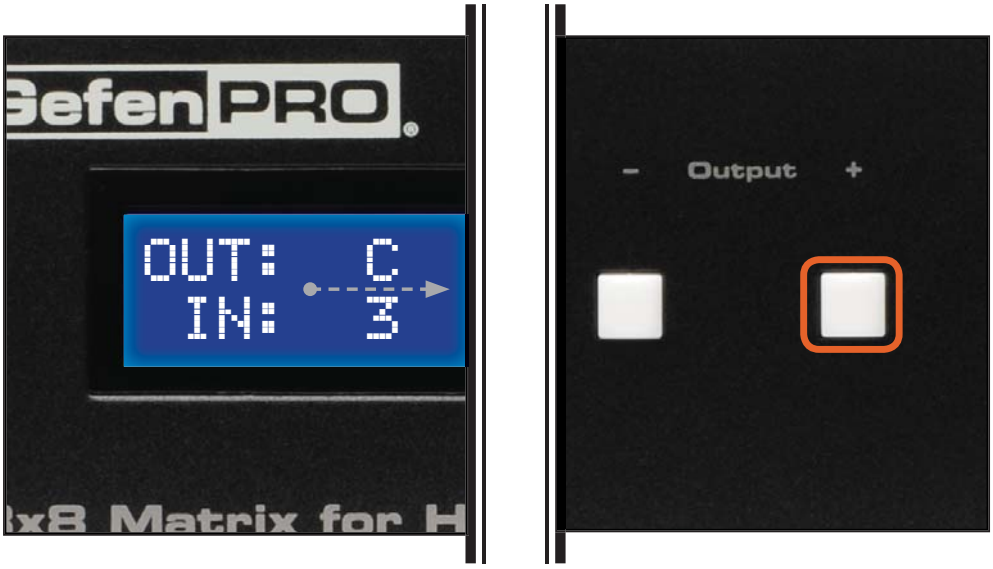
This is referred to as a “1-to-1” routing state. This is the factory (default) setting for the *8x8 Matrix for HDMI*.

Routing Sources

Selecting the Output

1. To select the output, press the **Out -** or **Out +** button once. The routing state for Output A will be displayed:

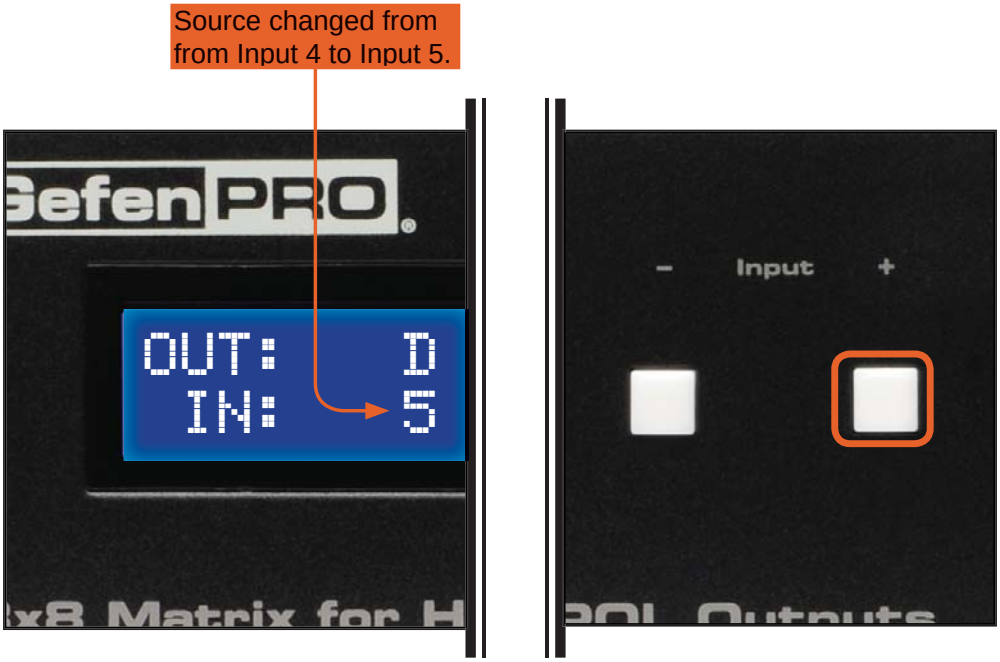
2. Press the **Out -** or **Out +** button to cycle through the routing state for each output. Consecutively pressing the **Out +** button will cycle through each output, from left to right.



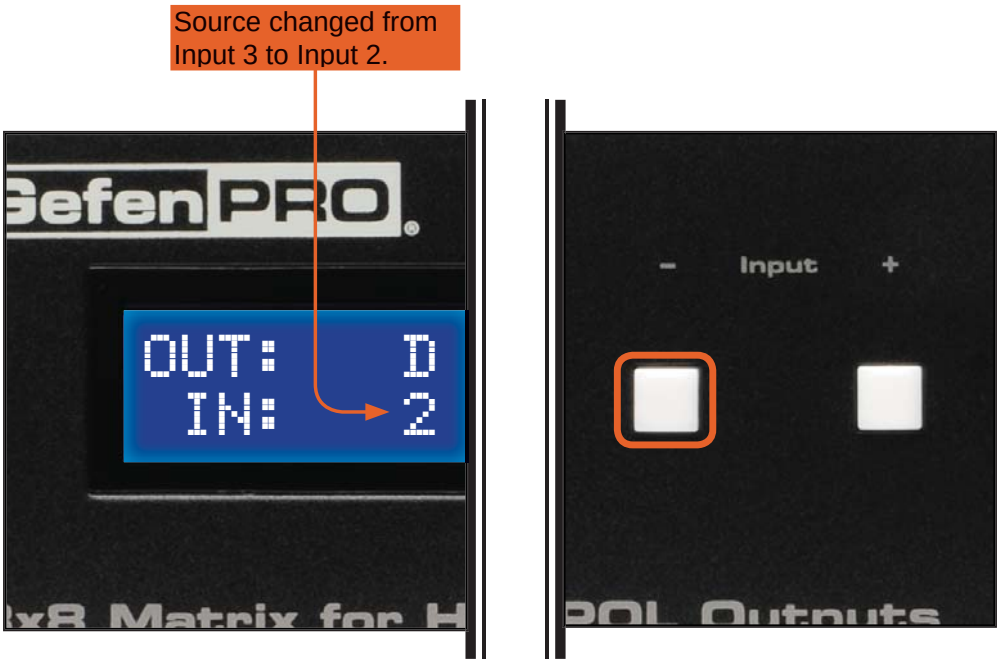
3. Consecutively pressing the **Out -** button will cycle through each output, from right to left.

Changing the Source

4. Once the desired output has been selected, press the **Input +** or **Input -** button. Consecutively pressing the **Input +** button will increment the input value by a factor of 1 (within a range of 1 - 8). For example, if Input 4 was originally routed to Output D, then pressing the **Input +** button will route Input 5 to Output D.



5. Consecutively pressing the **Input -** button will decrease the input value by a factor of 1 (within a range of 1 - 8). For example, if Input 3 was originally routed to Output D, pressing the **Input -** button will route Input 2 to Output D.



To change the routing status of another output, press the **Output +** or **Output -** buttons to navigate to the desired output. Use the **Input +** or **Input -** buttons to change the source.

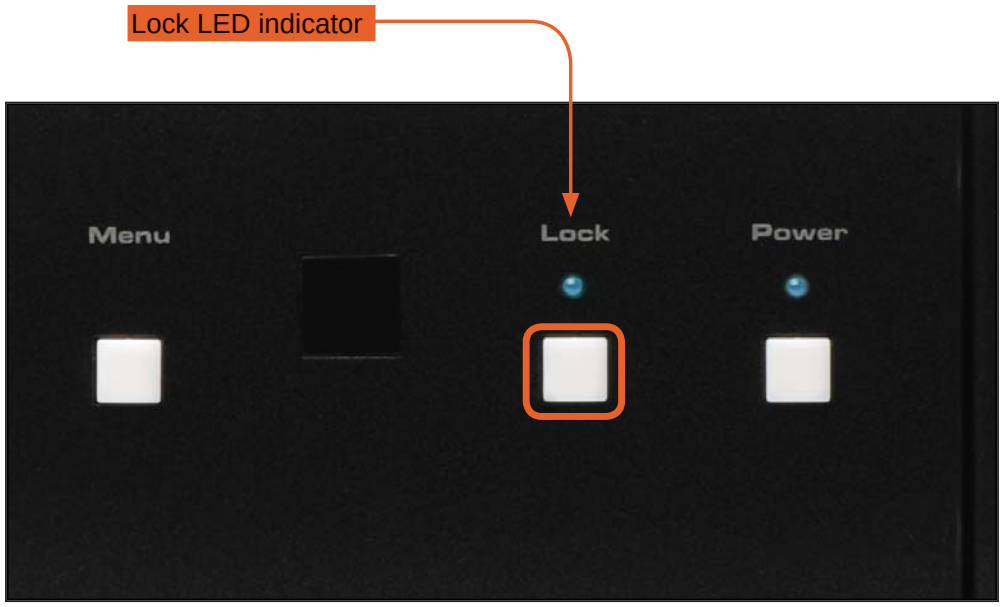
6. Press the **Menu** button to return to the Routing Screen.

NOTE: If the Menu button is not pressed after a routing change has been made, then the *8x8 Matrix for HDMI* will automatically return to the Routing Screen after about 20 seconds.

Locking / Unlocking the Front Panel

To prevent an accidental routing change or power-down (by pressing the **Power** button), the front-panel buttons on the *8x8 Matrix for HDMI w/4 ELR-POL Outputs* can be locked. Locking the matrix also disables many RS-232 / Telnet commands.

Press the **Lock** button on the front-panel:



The Lock LED will glow bright orange to indicate that the front-panel buttons on the *8x8 Matrix for HDMI w/4 ELR-POL Outputs* have been locked.

If any buttons (other than the **Lock** button) are pressed while the The *8x8 Matrix for HDMI* is Locked, the following message will be displayed:

1. To unlock the *8x8 Matrix for HDMI w/4 ELR-POL Outputs*, press the **Lock** button a second time.

Fast Switching Technology

Fast Switching Technology (FST) is a Gefen software implementation for HDMI products. FST was created to improve the lengthy HDMI authentication process, based on the HDMI and HDCP specifications.

FST provides quicker audio/video source switching and greatly improves the overall audio/video system behavior and performance when more than one HDTV display is used in the system setup.

FST allows connecting / disconnecting or turning ON / OFF of HDTV displays without having these activities affect other Hi-Def sources routed to any other HDTV display in the same system.

Fast Mode:

Setting the *8x8 Matrix for HDMI* to **Fast Mode** will improve performance when connecting / disconnecting Hi-Def sources, and powering ON / OFF HDTV displays.

NOTE: When switching from **Slow Mode** to **Fast Mode**, the HDTV displays connected to the Matrix will blink momentarily.

Slow Mode:

When set to **Slow Mode**, the Matrix will follow the standard authentication process, based on the HDMI and HDCP specifications. **Slow Mode** is recommended when the source does not support multiple devices.

Determining the Current Switching Mode

Each HDMI input can be set to **Fast Mode** or **Slow Mode**. It is recommended that each HDMI input be set to **Fast Mode** for best performance.

1. Consecutively press the **Menu** button on the front panel until the switching modes screen is displayed.

   The first row (IN) represents each HDMI input on the matrix. The bottom row (MODE) represents the current switching mode of each HDMI input.

Selecting the Input

2. To change the switching mode on an HDMI input, press the **Output -** (or **Output +**) button once. The switching mode for Input 1 will be displayed:

The letter **F** indicates that the HDMI input is using Fast Mode switching. If the HDMI input is set to Slow Mode switching, a letter **S** will be displayed under the input.

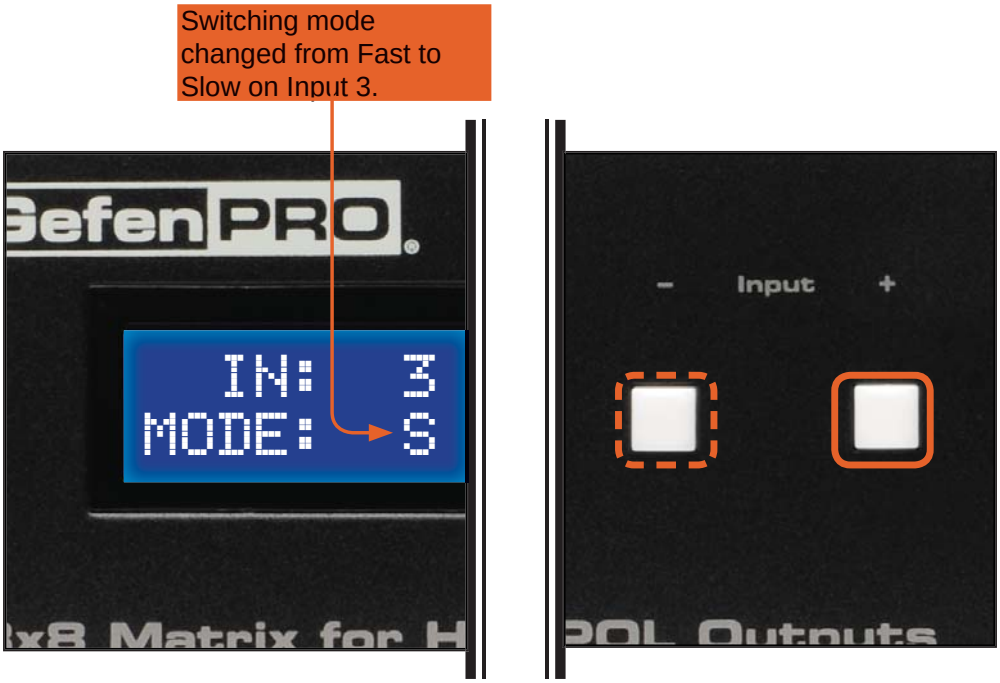
3. Press the **Output -** or **Output +** button again to cycle through the routing state for each output. Consecutively pressing the **Output +** button will cycle through each input, from left to right, starting with Input 1:

> **NOTE:** In Routing mode, the **Output +** and **Output -** buttons cycle through each *output*. In Switching mode, these same buttons are used to cycle through each *input*.

4. Consecutively pressing the **Output -** button will cycle through each output, from right to left:

Changing the Switching Mode

5. Once the desired input has been selected, press the **Input +** or **Input -** button to toggle between Fast or Slow switching mode.



To change the switching mode of another input, press the **Output +** or **Output -** button to navigate to the desired input. Press the **Input +** or **Input -** button to toggle the switching mode between Fast (F) or Slow (S).

6. Press the **Menu** button to return to the Switching mode Screen.

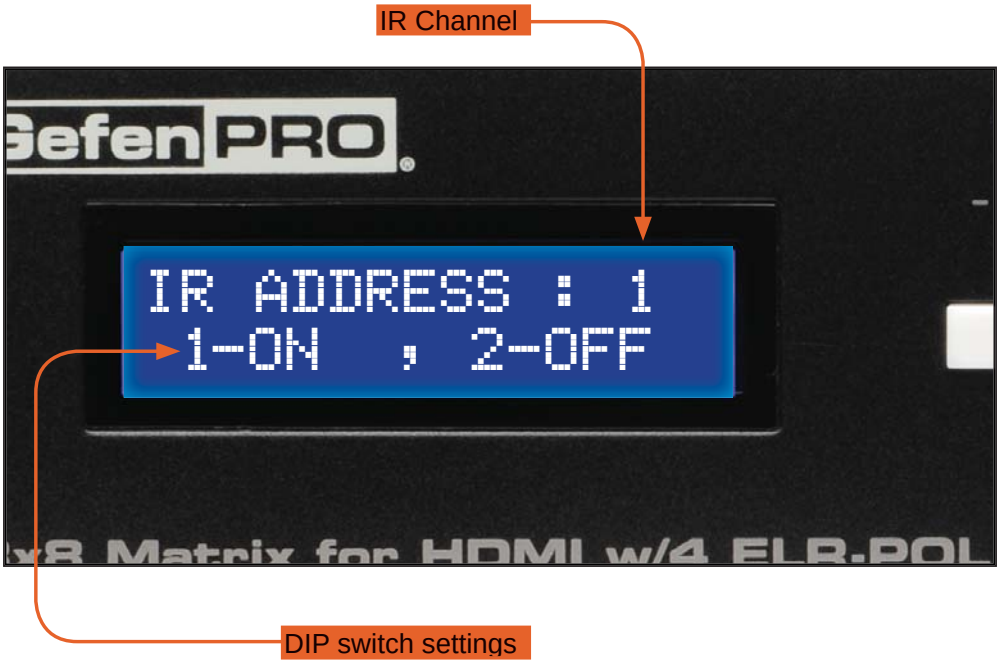
Press the **Menu** button a second time to return to the Routing screen.

Setting the IR Channel on the 8x8 Matrix for HDMI

In order for the *8x8 Matrix for HDMI* to communicate with the included IR Remote Control, both the matrix and the IR Remote Control must be set to the same IR channel. Follow the procedure outlined below to set the IR channel on the *8x8 Matrix for HDMI*.

1. From the Routing screen, simultaneously press the **Input -**, **Input +**, and the **Output -** buttons to display the IR address screen. The current IR address will be displayed along with the DIP switch settings for the IR remote control:

2. Use the **Input +** (or **Input -**) button to change the IR channel. Press the **Input -** button to decrease the IR channel value. Press the **Input +** button to increase the IR channel value.



3. After setting the IR address, make sure that the DIP switches on the IR Remote Control are set according to the information in the LCD display. See page 11 for information on setting the IR channel for the IR Remote Control unit.

In this case, the *8x8 Matrix for HDMI* is set to IR channel 1. Therefore, DIP switch 1 on the IR Remote Control must be set to the ON position and DIP switch 2 must be set to the OFF position.

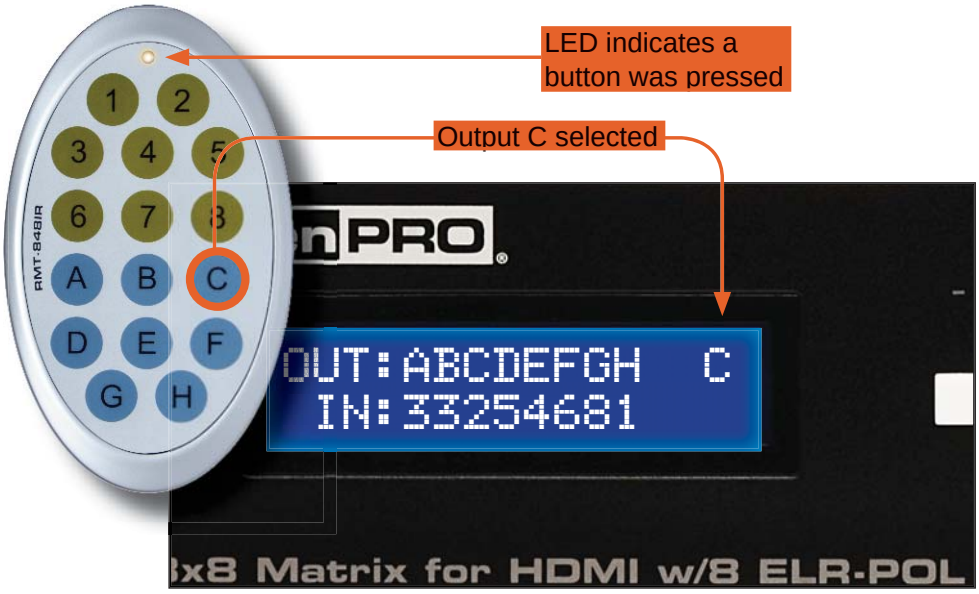
4. Press the **Menu** button to return to the Routing screen.

Routing Sources using the IR Remote Control

Buttons **1 - 8** on the IR remote control correspond to each HDMI input (Input 1 - 8) on the Matrix. Buttons **A - D** correspond to each HDMI output (Output A - D) and buttons **E-H** correspond to each ELR-POL output (Output E-H)**.** To route a source to a display, press the desired output first, then press the input.

Routing Example: Route Input 4 to Output C

1. Select Output C by pressing button **C** on the IR Remote Control. The number 3 will appear in the upper right-hand corner of the LCD display:


LED indicates a button was pressed
Output C selected
1 2 3 4 5 6 7 8 A B C D E F G H
OUT:ABCDEFGH C
IN:33254681
x8 Matrix for HDMI w/8 ELR-POL

2. Select Input 4 by pressing button **4** on the IR Remote Control. The number 4 will appear in the lower right-hand corner of the LCD display:

3. After the input and output have been selected on the IR Remote Control, the numbers on the far right-hand of the LCD display will disappear and the new routing state will be displayed in the LCD display:

Input 4 is routed to Output C

External EDID Management

The *8x8 Matrix for HDMI* features EDID Management. Before the source can send video or audio signals, the source device reads the EDID (Extended Display Identification Data) from the output devices connected to the Splitter. The EDID contains information about what type of audio/video data that the source can send to each output device.

The *8x8 Matrix for HDMI* routes multiple sources to multiple output devices. This involves reading EDID data from more than one device. Management of the EDID data is important to maintain compatibility between all devices.

The following EDID features are copied from Output A:

- Supported Resolutions
- 3D Support
- Audio Features

Display Connections:

- If a device is not connected to Output A, then no EDID changes are made, meaning that the previous EDID information will be used. This state will be in effect until a display is connected to Output A and the Matrix is power-cycled.
- EDID is built from Output A to the Input. The audio block will be copied from Output A. EDID-copying is performed only when the Matrix is reset or power-cycled.

Only Pins 2 (RX), 3 (TX), and 5 (Ground) are used on the RS-232 serial interface

RS232 Settings

Bits per second 19200

Data bits 8

Parity ..... None

Stop bits 1

Flow Control ..... None

NOTE: When the matrix is locked, routing and “set”-type commands will not function. The #lock_matrix command must be used before issuing any commands within this class. See page 61.

IMPORTANT: When sending RS-232 commands, a *carriage return* and a *line feed* character must be included at the end of each line. Commands are *not* case-sensitive.

Configuring the IP Address

The *8x8 Crosspoint Matrix for HDMI* supports IP-based control using Telnet. To set up Telnet control, the network settings for the matrix must be configured via RS-232. The default network settings for the matrix are as follows:

IP Address:	`192.168.1.72`
Subnet:	`255.255.255.0`
Gateway:	`192.168.1.254`
HTTP Port:	`80`
Telnet Port:	`23`

1. Connect an RS-232 cable from the PC to the matrix.

2. Launch a terminal emulation program (e.g. HyperTerminal) and use the following settings:

Baud Rate:	19200
Data Bits:	8
Parity:	None
Stop Bits:	1
Flow Control:	None

   NOTE: Depending upon the network, the IP address, subnet mask, gateway (router) IP, Telnet port, and HTTP port will need to be set. Consult your network administrator to obtain the proper settings.

3. Set the IP address for the matrix using the `#sipadd` command (see page 56 for details).

4. Set the subnet mask using the `#snetmask` command (see page 57 for details).

5. Set the gateway (router) IP address using the `#sgateway` command (see page 50 for details).

6. Set the Telnet listening port using the `#set_telnet_port` command (see page 46 for details).

7. Set the HTTP listening port using the `#set_http_port` command (see page 43 for details)

8. Power-cycle the matrix to reboot and complete all IP setting changes.

9. After the matrix has rebooted, use the IP address that was specified in step 3 to Telnet to the matrix.

IP / Telnet Configuration

Command	Description
#display_telnet_welcome	Set Telnet welcome message on login
#ipconfig	Displays all TCP/IP settings
#resetip	Resets IP configuration to factory settings
#set_http_port	Sets the Web server listening port
#set_mac_addr	Sets the MAC address of the Matrix
#set_telnet_pass	Prompts for password when using Telnet
#set_telnet_port	Sets the Telnet listening port
#set_telnet_username	Sets the user name for the login procedure
#set_webui_pass	Sets the password for the Web interface
#set_webui_username	Sets the user name for the Web interface
#sgateway	Sets the IP gateway address
#show_gateway	Displays the gateway address
#show_http_port	Displays the HTTP listening port
#show_ip	Displays the IP address of the Matrix
#show_mac_addr	Displays the MAC address of the Matrix
#show_netmask	Displays the netmask address
#show_telnet_port	Displays the Telnet listening port
#show_telnet_username	Prompts for user name when using Telnet
#show_ver_data	Displays the hardware / software version
#show_webui_username	Displays the user name for the Web interface
#sipadd	Sets the IP address of the matrix
#snetmask	Sets the IP network mask
#use_telnet_pass	Use password during Telnet sessions
#use_webui_pass	Sets the password for the Web interface

#display_telnet_welcome Command

The #display_telnet_welcome command sets (enables/disables) the Telnet welcome message on login.

Syntax:

```
#display_telnet_welcome param1
```

Parameters:

param1 State [0 - 1]

State	Meaning
0	Do not display welcome message
1	Display welcome message

Example:

```
#display_telnet_welcome 1
#Telnet Welcome Screen is Enable

#display_telnet_welcome 0
#Telnet Welcome Screen is Disable
```

#ipconfig Command

The #ipconfig command displays the current TCP/IP settings for the matrix.

Syntax:

```
#ipconfig
```

Parameters:

None

Example:

```
#ipconfig

-------------- TCP/IP settings -------------


MAC add  = 00:1C:91:01:50:07
IP add   = 192.168.1.72
Net Mask = 255.255.255.0
Gateway  = 192.168.2.1
Web Server Port = 80
Telnet Server Port = 23
Telnet password at login is set to ON
Telnet welcome at login is set to ON
```

#resetip Command

The #resetip command resets all TCP/IP settings to factory defaults.

Syntax:

```
#resetip
```

Parameters:

None

Notes:

The matrix must be rebooted after executing this command.

Example:

```
#resetip
IP Configuration Was Reset To Factory Defaults.
```

After rebooting the matrix, the IP settings will be cleared. Running the #ipconfig command will display the updated information:

```
#ipconfig
IP: 0.0.0.0
SUBNET: 0.0.0.0
GATEWAY: 0.0.0.0
```

#set_http_port Command

The #set_http_port command sets the Web server listening port. The underscore characters ("_") must be included when typing the command name. The default port setting is 80. Also see the `#show_http_port` on page 51.

Syntax:

```
#set_http_port param1
```

Parameters:

param1	Port	[0 - 65535]

Notes:
The matrix must be rebooted after executing this command.

Example:

```
#set_http_port 70
HTTP Communication Port 80 Is Set.  Please Reboot The Unit.
```

#set_mac_addr Command

The #set_mac_addr command set the MAC address of the Matrix.
The underscore characters (“_”) must be included when typing the command name. The MAC address must be specified using dot-decimal notation.

Syntax:

```
#set_mac_addr param1
```

Parameters:

param1	MAC address

Notes:
The MAC address should not be changed. This command is for administrator use only. The matrix must be rebooted after executing this command.

Example:

```
#set_mac_addr 00.12.0e.f1.7a.ea
MAC ADDRESS 00.12.0e.f1.7a.ea IS SET.  PLEASE REBOOT THE
UNIT.
```

#set_telnet_pass Command

The #set_telnet_pass command sets the Telnet password. The underscore characters ("_") must be included when typing the command name.
The maximum length of the password is 20 characters. The password is case-sensitive. The default Telnet password is `Admin`.

Syntax:

```
#set_telnet_pass param1
```

Parameters:

param1	Password

Notes:
The matrix must be rebooted after executing this command.

Example:

```
#set_telnet_pass OK_Corral
TELNET Interface Password Is Set.
```

#set_telnet_port Command

The #set_telnet_port command sets the Telnet listening port. The underscore characters ("_") must be included when typing the command name. The default port value is 23.

Syntax:

```
#set_telnet_port param1
```

Parameters:

param1	Port	[0 - 65535]

Notes:
The matrix must be rebooted after executing this command.

Example:

```
#set_telnet_port 20
Telnet Communication Port 23 Is Set.  Please Reboot The
Unit.
```

#set_telnet_username Command

The #set_telnet_username command sets the Telnet user name.
The underscore characters (“_”) must be included when typing the command name. The maximum length of the user name is 8 characters. The user name is case-sensitive. The default Telnet username is `Admin`.

Syntax:

```
#set_telnet_username param1
```

Parameters:

param1	User name

Notes:
The matrix must be rebooted after executing this command.

Example:

```
#set_telnet_username Doc_Holiday
```

#set_webui_pass Command

The #set_webui_pass command sets the password for the Web interface. The underscore characters ("_") must be included when typing the command name. The maximum length of the password is 8 characters.

Syntax:

```
#set_webui_pass param1
```

Parameters:

param1	Password

Notes:

The matrix must be rebooted after executing this command.

Example:

```
#set_webui_pass reindeer
Web UI Password Is Set.
```

#set_webui_username Command

The #set_webui_username command sets the user name for the Web interface. The underscore characters (“_”) must be included when typing the command name. The maximum length of the password is 8 characters.

Syntax:

```
#set_webui_username param1
```

Parameters:

param1	User name

Notes:
The matrix must be rebooted after executing this command.

Example:

```
#set_webui_username holly_jolly
Web UI Password Is Set.
```

#sgateway Command

The #sgateway sets the IP gateway (router) address. Dot-decimal notation must be used when specifying the IP address. The default Gateway IP address is `192.168.1.254`.

Syntax:

```
#sgateway param1
```

Parameters:

param1	IP gateway

Notes:
The matrix must be rebooted after executing this command.

Example:

```
#sgateway 192.168.2.1
GateWay Address 192.168.2.1 Is Set. Please Reboot The Unit.
```

#show_gateway Command

The #show_gateway command shows the current gateway address.
The underscore characters (“_”) must be included when typing the command name.

Syntax:

```
#show_gateway
```

Parameters:

None

Example:

```
#show_gateway
GATEWAY ADDRESS IS: 192.168.2.1
```

#show_http_port Command

The #show_http_port command shows the current HTTP listening port.
The underscore characters (“_”) must be included when typing the command name.

Syntax:

```
#show_http_port
```

Parameters:

None

Example:

```
#show_http_port
HTTP COMMUNICATION PORT IS: 80
```

#show_ip Command

The #show_ip command shows the current IP address of the Matrix.
The underscore character (“_”) must be included when typing the command name.

Syntax:

```
#show_ip
```

Parameters:

None

Example:

```
#show_ip
IP ADDRESS IS: 192.168.1.72
```

#show_mac_addr Command

The #show_mac_addr command shows the MAC address of the Matrix.
The underscore characters (“_”) must be included when typing the command name.

Syntax:

```
#show_mac_addr
```

Parameters:

None

Example:

```
#show_mac_addr
MAC ADDRESS IS: 00-12-0e-f1-7a-ea
```

#show_netmask Command

The #show_netmask shows the netmask address. The underscore character ("_") must be included when typing the command name.

Syntax:

```
#show_netmask
```

Parameters:

None

Example:

```
#show_netmask
NET MASK ADDRESS IS: 255.255.255.0
```

#**show_telnet_port Command**

The #show_telnet_port command shows the current Telnet listening port.

Syntax:

```
#show_telnet_port
```

Parameters:

None

Example:

```
#show_telnet_port
TELNET COMMUNICATION PORT IS: 23
```

#show_telnet_username Command

The #show_telnet_username command returns the user name required for login. The underscore characters (“_”) must be included when typing the command name.

Syntax:

```
#show_telnet_username
```

Parameters:

None

Example:

```
#show_telnet_username
TELNET User Name Doc_Holiday Is Set.
```

#show_ver_data Command

The #show_ver_data command displays the hardware and firmware version of the Matrix. The underscore characters (“_”) must be included when typing the command name.

Syntax:

```
#show_ver_data
```

Parameters:

None

Example:

```
#show_ver_data
SOFTWARE AND HARDWARE VERSION: v2.0J PCB-1707*B
```

#show_webui_username Command

The #show_webui_username command returns the user name required for login. The underscore characters (“_”) must be included when typing the command name.

Syntax:

```
#show_webui_username
```

Parameters:

None

Example:

```
#show_webui_username
The User Name For The Web UI is: holly_jolly
```

#sipadd Command

The #sipadd command sets the IP address of the matrix. Dot-decimal notation must be used when specifying the IP address.

Syntax:

```
#sipadd param1
```

Parameters:

param1	IP address

Notes:

The matrix must be rebooted after executing this command.

Example:

```
#sipadd 192.168.1.72
IP Address 192.168.2.238 Is Set. Please Reboot The Unit.
```

#snetmask Command

The #snetmask command sets the IP network subnet mask. Dot-decimal notation must be used when specifying the IP network mask. The default subnet mask is: `255.255.255.0`

Syntax:

```
#snetmask param1
```

Parameters:

param1	Subnet mask

Notes:
The matrix must be rebooted after executing this command.

Syntax:

```
#snetmask 255.255.0.0
```

```
NetMask Address 255.255.255.0 Is Set.  Please Reboot The
Unit.
```

#use_telnet_pass Command

The #use_telnet_pass command requires or disables Telnet login credentials. The default setting is disabled (param1 = 0). The underscore characters ("_") must be included when typing the command name.

Syntax:

```
#use_telnet_pass param1
```

Parameters:

param1 State [0 - 1]

Value	Meaning
0	Disable password
1	Enable (force) password

Example:

```
#use_telnet_pass 1
Telnet Interface Password Is Enable

#use_telnet_pass 0
Telnet Interface Password Is Disable
```

#use_webui_pass Command

The #use_webui_pass command requires or disables Web UI login credentials. The default setting is disabled (param1 = 0). The underscore characters ("_") must be included when typing the command name.

Syntax:

```
#use_webui_pass param1
```

Parameters:

param1 State [0 - 1]

Value	Meaning
0	Disable password
1	Enable (force) password

Examples:

```
#use_telnet_pass 1
Web UI Password Is Enable

#use_telnet_pass 0
Web UI Password Is Disable
```

Routing / Naming / Presets

Command	Description
#lock_matrix	Locks / unlocks the Matrix
#recall_preset	Recalls a routing / mask preset
#save_preset	Saves the current routing/masking state to a preset
#set_input_name	Specifies a name for an input
#set_output_name	Specifies a name for an output
#show_input_name	Displays the specified input name
#show_output_name	Displays the specified output name
#show_r	Displays the current routing state of the specified output
r	Routes the specified inputs to the specified outputs
s	Routes all outputs are routed to the specified input

#lock_matrix Command

The #lock_matrix command locks / unlocks the Matrix. When the Matrix is locked, all functions are disabled including the front panel, RS-232, and Telnet. The underscore character ("_") must be included when typing the command name.

Syntax:

```
#lock_matrix param1
```

Parameters:

param1 Value [0 - 1]

Value	Meaning
0	Unlock Matrix
1	Lock Matrix

Example:

```
#lock_matrix 1
MATRIX IS LOCKED

#lock_matrix 0
MATRIX IS UNLOCKED
```

#recall_preset Command

The #recall_preset command recalls a routing preset. Any masked outputs will also be recalled. The underscore character ("_") must be included when typing the command name.

Syntax:

```
#recall_preset param1
```

Parameters:

param1	Preset	[1 - 8]

Example:

```
#recall_preset 1
RECALLED THE ROUTING STATE SAVES TO PRESET 1
```

#save_preset Command

The #save_preset command saves the current routing state to the specified preset. Any masked outputs will also be saved as part of the current routing state. The underscore character ("_") must be included when typing the command name.

Syntax:

```
#save_preset param1
```

Parameters:

param1	Preset	[1 - 8]

Example:

```
#save_preset 1
CURRENT ROUTING STATE IS SAVED TO PRESET/INPUT 1
```

#set_input_name Command

The #set_input_name command provides a name to the selected input. For example, “Input 1” could be renamed as “DVD_Player”. The maximum string length for *param2* is 15 characters. Special characters and spaces are not permitted. If needed, use the underscore character (“_”) to separate characters. The underscore character (“_”) must be included when typing the command name.

Syntax:

```
#set_input_name param1 param2
```

Parameters:

param1	Input	[1 - 8]
param2	Name	

Example:

```
#set_input_name 5 Blu_ray
Blu_ray NAME IS ASSIGNED TO INPUT 5
```

#set_output_name Command

The #set_output_name command provides a name to the selected output. For example, “Output 1” could be renamed as “HDDisplay”. The maximum string length for *param2* is 15 characters. Special characters and spaces are not permitted. If needed, use the underscore character (“_”) to separate characters. The underscore character (“_”) must be included when typing the command name.

Syntax:

```
#set_output_name param1 param2
```

Parameters:

param1	Output	[A - H]
param2	Name	

Example:

```
#set_output_name C Sony_XBR7
Sony_XBR7 NAME IS ASSIGNED TO OUTPUT C
```

#show_input_name Command

The #show_input_name command shows the name provided to the specified input using the #set_input_name command. The underscore character ("_") must be included when typing the command name.

Syntax:

```
#show_input_name param1
```

Parameters:

param1	Input	[1 - 8]

Example:

```
#show_input_name 5
THE NAME FOR INPUT 5 IS: Blu_ray
```

#show_output_name Command

The #show_output_name command shows the name provided to the specified input using the #set_output_name command.

Syntax:

```
#show_output_name param1
```

Parameters:

param1	Output	[A - H]

Example:

```
#show_output_name C
THE NAME FOR OUTPUT C IS: Sony_XBR
```

#show_r Command

The #show_r command shows the current routing status of the specified output. The underscore character ("_") must be included when typing the command name.

Syntax:

```
#show_r param1
```

Parameters:

param1	Output	[A - H]

Notes:

If the output has been renamed using the #set_output_name command, then the name assigned to the output will be included in parentheses.

Example:

```
#show_r c
OUTPUT C(Sony_XBR) IS ROUTED TO INPUT 4
```

r Command

The r command routes the specified input to the specified outputs. If *param2* is set to 0, then the specified input is routed to all outputs. Unlike other commands, do not precede the r command with the "#' symbol.

Syntax:

```
r param1 param2[...param9]
```

Parameters:

param1	Input	[1 - 8]
param2	Outputs	[A - H]

Examples:

```
r 7 A C D F G H
INPUT 7 IS SET TO OUTPUTS A, C, D, F, G, H

r 2 0
INPUT 2 IS SET TO ALL OUTPUTS.
```

s Command

The s command routes the specified input to all outputs. Unlike other commands, do not precede the r command with the "#' symbol.

Syntax:

```
s param1
```

Parameters:

param1	Input	[1 - 8]

Examples:

```
s 2
INPUT 2 IS SET TO ALL OUTPUTS.
```

Status

Command	Description
#help	Displays all available commands
#show_fw	Displays the Matrix firmware version
#show_hpd	Displays the HPD status of the specified output
#show_rsense	Displays the RSENSE status of the specified output
m	Displays the current matrix routing status in table format
n	Displays the routing status for the specified output

#help Command

The #help command displays help on the specified command. If *param1* is not specified, then the full list of commands is displayed.

Syntax:

```
#help [param1]
```

Parameters:

param1 Command name (optional)

Example:

```
#help #recall_preset
RECALL A ROUTING STATE PRESET
PARAM 1 = 1 - 8 (PRESET/INPUT)
```

#show_fw Command

The #show_fw command displays the current firmware version of the Matrix. The underscore character ("_") must be included when typing the command name.

Syntax:

```
#show_fw
```

Parameters:

None

Example:

```
#show_fw
FIRMWARE VERSION = EXT_HDFST_848CPN v2.0J
```

#show_hdp Command

The #show_hpd command displays the HPD (Hot-Plug Detect) status of the specified output. The underscore character ("_") must be included when typing the command name.

Syntax:

```
#show_hpd param1
```

Parameters:

param1	Output	[A - H]

Notes:

If the output has been renamed using the #set_output_name command, then the name assigned to the output will be included in parentheses.

Examples:

```
#show_hpd C
HPD OF OUTPUT C(Sony_XBR) IS LOW

#show_hpd A
HPD OF OUTPUT A IS HIGH
```

#show_rsense Command

The #show_rsense command displays Rsense status of the specified output. The underscore character ("_") must be included when typing the command name.

Syntax:

```
#show_rsense param1
```

Parameters:

param1	Output	[A - H]

Notes:

If the output has been renamed using the #set_output_name command, then the name assigned to the output will be included in parentheses.

Examples:

```
#show_rsense A
RSENSE OF OUTPUT A IS LOW

#show_rsense C
RSENSE OF OUTPUT C(Sony_XBR) IS HIGH
```

m Command

The m command displays the current matrix routing status in table format. Unlike other commands, do not precede the m command with the “#’ symbol.

Syntax:

m

Parameters:

None

Example:

m

```
Out: A B C D E F G H
 In: 3 3 4 3 4 6 8 1

ALL OUTPUTS ARE UNMASKED
MATRIX IS UNLOCKED
```

n Command

The n command displays the current input-output routing state for the specified output. Unlike other commands, do not precede the n command with the "#' symbol.

Syntax:

```
n param1
```

Parameters:

param1	Output	[A - H]

Notes:

If *param1* = 0, then the routing status for all outputs will be displayed.

Examples:

```
n A
A3

n 0
A3B3C4D3E4F6G8H1
```

Masking

Command	Description
#activeisp	Activates ISP mode for firmware updates
#echo	Enables / disables RS-232 feedback
#fadefault	Resets the matrix to factory defaults
#mask	Masks the specified outputs
#power	Powers the matrix on or off
#reboot	Reboots the matrix
#set_ir	Sets the IR channel of the matrix
#show_ir	Displays the current IR channel of the matrix
#show_mask	Displays the output masking status
#show_out_colordpt	Shows the highest color depth supported by the display based on the EDID
#show_out_res	Shows the highest resolution supported by the display based on the EDID
#unmask	Unmasks the selected outputs

#activeisp Command

The #activeisp command activates ISP mode for upgrading the firmware.

Syntax:

`#activeisp`

Parameters:

None

Example:

`#activeisp`

#echo Command

The #echo command enables / disables serial port (terminal) echo.

Syntax:

```
#echo
```

Parameters:

param1 Value [0 - 1]

Value	Meaning
0	Disable feedback
1	Enable feedback

Examples:

```
#echo 1
LOCAL ECHO IS ON

#echo 0
LOCAL ECHO IS OFF
```

#fadefault Command

The #fadefault command disables the EDID lock state, sets the default routing state (1-1, 2-2, 3-3, etc.), resets the input and output names to the default names (e.g. Output 1, Input 1), and resets the IP configuration to the default settings.

Syntax:

```
#fadefault
```

Parameters:

None

Syntax:

```
#fadefault
MATRIX WAS RESET TO FACTORY DEFAULTS
INPUT 1 IS ROUTED TO OUTPUT 1
INPUT 2 IS ROUTED TO OUTPUT 2
INPUT 3 IS ROUTED TO OUTPUT 3
INPUT 4 IS ROUTED TO OUTPUT 4
INPUT 5 IS ROUTED TO OUTPUT 5
INPUT 6 IS ROUTED TO OUTPUT 6
INPUT 7 IS ROUTED TO OUTPUT 7
INPUT 8 IS ROUTED TO OUTPUT 8
LOCAL ECHO IS ON
ALL OUTPUTS ARE UNMASKED
ALL INPUTS ARE SET TO FST FAST MODE
IP ADDRESS IS: 192.168.1.72
GATEWAY ADDRESS IS: 192.168.1.254
NET MASK ADDRESS IS: 255.255.255.0
HTTP Communication Port 80 Is Set.
Telnet Communication Port 23 Is Set.
Telnet Interace Password Is Enable
Telnet Welcome Screen Is Enable
Please Reboot The Unit.
```

#mask Command

The #mask command masks the specified outputs. If *param1* is set to 0, then all outputs are masked.

Syntax:

```
#mask param1[...param9]
```

Parameters:

param1	Output	[A - H]

Examples:

```
#mask c f
OUTPUTS C, F ARE MASKED

#mask 0
ALL OUTPUTS ARE MASKED
```

#power Command

The #power command toggles the power state on the matrix.

Syntax:

```
#power param1
```

Parameters:

param1 State [0 - 1]

Value	Meaning
0	Power matrix OFF
1	Power matrix ON

Example:

```
#power 0
MATRIX IS OFF

#power 1
MATRIX IS ON
```

#reboot Command

The #reboot command reboots the matrix.

Syntax:

```
#reboot
```

Parameters:

None

Example:

```
#reboot

MATRIX WILL REBOOT SHORTLY *REBOOT UNIT IN 2 SECONDS
EXT_HDFST_848CPN v2.0J
A1B2C3D4E5F6G7H8
```

#set_ir Command

The #set_ir set the IR channel for the matrix. The associated DIP switch settings for the IR remote control unit are returned. See page 11 for details on setting the IR channel for the IR remote control. The underscore character ("_") must be included when typing the command name.

Syntax:

```
#set_ir param1
```

Parameters:

param1	Channel	[0 - 3]

Example:

```
#set_ir 2
IR CHANNEL IS SET TO CHANNEL 2
```

#show_ir Command

The #show_ir displays the current IR channel for the matrix. The underscore character ("_") must be included when typing the command name.

Syntax:

```
#show_ir
```

Parameters:

None

Example:

```
#show_ir
CURRENT IR CHANNEL IS: 2
```

#show_mask Command

The #show_mask command shows the mask status for the specified output. The underscore character ("_") must be included when typing the command name.

Syntax:

```
#show_mask param1
```

Parameters:

param1	Output	[A - H]

Example:

```
#show_mask d
OUTPUT  IS UNMASKED

#show_mask c
OUTPUT C(Sony_XBR) IS MASKED
```

#show_out_colordpt Command

The #show_out_colordpt command displays the highest color depth supported by the specified display based on the EDID. The underscore characters ("_") must be included when typing the command name.

Syntax:

```
#show_out_colordpt param1
```

Parameters:

param1	Output	[A - H]

Example:

```
#show_out_colordpt a
12 BITS HDMI
```

If no display (sink) signal is detected, then the #show_out_colordpt will return the following:

```
#show_out_colordpt a
NO SIGNAL
```

#show_out_res Command

The #show_out_res command displays the highest resolution supported by the specified display based on the EDID.

Syntax:

```
#show_out_res param1
```

Parameters:

param1	Output	[A - H]

Example:

```
#show_out_res c
1080P 60HZ HDMI
```

If no display (sink) signal is detected, then the #show_out_colordpt will return the following:

```
#show_out_res c
NO SIGNAL
```

#unmask Command

The #unmask command unmasks the specified outputs. If *param1* is set to 0, then all outputs are unmasked.

Syntax:

```
#unmask param1[...param9]
```

Parameters:

param1	Output	[A - H]

Examples:

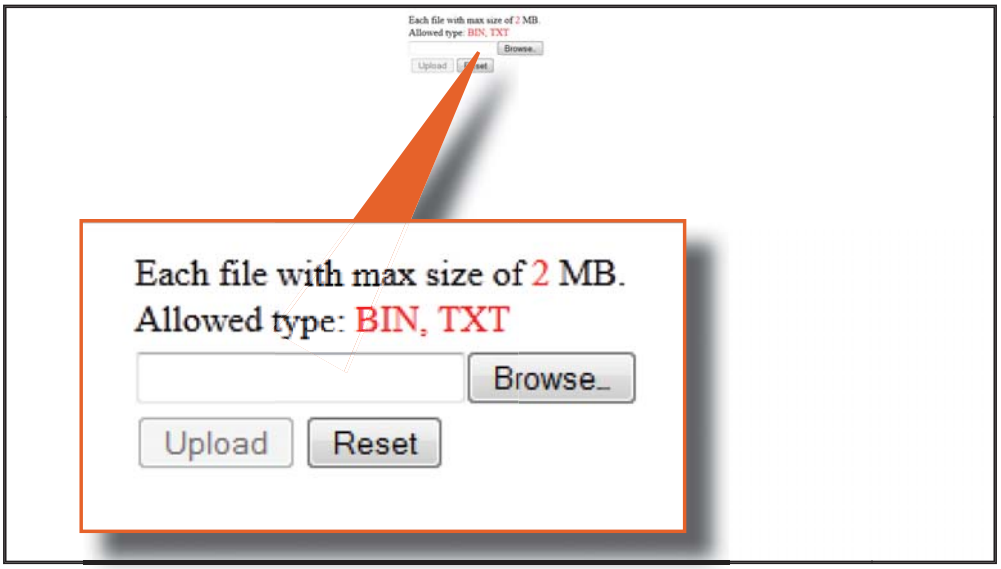
```
#unmask d
OUTPUT F IS UNMASKED

#unmask 0
ALL OUTPUTS ARE UNMASKED
```

Firmware Update Procedure

The following items are required to update the matrix firmware:

- GefenPRO *8x8 Matrix for HDMI w/4 ELR-POL Outputs*.
- Ethernet cable
- Firmware files: GEF-HDFST-848(vXX)(PACK).bin, where vXX = firmware version.

1. Power-on the matrix.
2. Connect the Ethernet cable between the matrix and the computer containing the firmware file.
3. In a Web browser, type in the IP address of the matrix. The following page will be displayed:



4. Click the Browse button to display the File Upload dialog.
5. Select the firmware file and click Open.
6. Click the Upload button on the Web page.

   The update process should take approximately 5 minutes.

a. Maximum recommended ambient temperature: 40 ˚C (104 ˚F).

b. Increase the air flow as needed to maintain the recommended temperature inside the rack.

c. Do not exceed maximum weight loads for the rack. Install heavier equipment in the lower part of the rack to maintain stability.

SPECIFICATIONS

Maximum Pixel Clock.....225 MHz

Video Input Connectors (Matrix)..... (8) HDMI Type A, 19-pin, female, locking

Video Output Connectors (Matrix).....(4) HDMI Type A, 19-pin, female

(4) ELR-POL, RJ-45, female

Video Input Connector (Receiver)..... (1) RJ-45, female

Video Output Connector (Receiver)..... (1) HDMI Type A 19-pin, female, locking

Power Indicator (Matrix/Receiver).....LED, blue=On, red=Standby

Lock Indicator (Matrix).....LED, blue

USB Port (Matrix)..... Mini-B, female

Ethernet Port (Matrix)..... (1) RJ45, female, 10/100 BaseT

RS-232 Port (Matrix)..... (1) DB-9, female

IR Extender Port (Matrix)..... (1) 3.5mm mini-stereo jack

Power Supply..... 100V to 240V AC 50/60 Hz, Internal

Power Consumption (Matrix)..... 120W (max.)

Operating Temperature..... 0 to + 40 °C

Rack mounting requirements (Matrix)..... Standard 19” rack, 2U high

Dimensions (W x H x D) (Matrix).....17.25” x 3.5” x 12”
(440mm x 89mm x 305mm)

Dimensions (W x H x D) (Receiver)..... 4.4” x 1.1” x 3.35”
(110mm x 27mm x 85mm)

Shipping Weight (1 Matrix with 8 Receivers)..... 37 lbs. (16.8 kg)

Gefen warrants the equipment it manufactures to be free from defects in material and workmanship.

If equipment fails because of such defects and Gefen is notified within two (2) years from the date of shipment, Gefen will, at its option, repair or replace the equipment, provided that the equipment has not been subjected to mechanical, electrical, or other abuse or modifications. Equipment that fails under conditions other than those covered will be repaired at the current price of parts and labor in effect at the time of repair. Such repairs are warranted for ninety (90) days from the day of reshipment to the Buyer.

This warranty is in lieu of all other warranties expressed or implied, including without limitation, any implied warranty or merchantability or fitness for any particular purpose, all of which are expressly disclaimed.

1. Proof of sale may be required in order to claim warranty.

2. Customers outside the US are responsible for shipping charges to and from Gefen.

3. Copper cables are limited to a 30 day warranty and cables must be in their original condition.

The information in this manual has been carefully checked and is believed to be accurate. However, Gefen assumes no responsibility for any inaccuracies that may be contained in this manual. In no event will Gefen be liable for direct, indirect, special, incidental, or consequential damages resulting from any defect or omission in this manual, even if advised of the possibility of such damages. The technical information contained herein regarding the features and specifications is subject to change without notice.

For the latest warranty coverage information, refer to the Warranty and Return Policy under the Support section of the Gefen Web site at www.gefen.com.

PRODUCT REGISTRATION

Please register your product online by visiting the Register Product page under the Support section of the Gefen Web site.

GEF-HDFST-848-4ELR

Rev A1

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This product uses UL or CE listed power supplies.